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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/773,710	02/06/2004	Richard Gagg	1406/184	8305
25297	7590	06/08/2005		EXAMINER
JENKINS, WILSON & TAYLOR, P. A. 3100 TOWER BLVD SUITE 1400 DURHAM, NC 27707			LE, DINH THANH	
			ART UNIT	PAPER NUMBER
			2816	

DATE MAILED: 06/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/773,710	GAGGL ET AL
	<b>Examiner</b>	<b>Art Unit</b>
	DINH T. LE	2816

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)  Responsive to communication(s) filed on \_\_\_\_\_.  
2a)  This action is **FINAL**.                    2b)  This action is non-final.  
3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4)  Claim(s) 1-36 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5)  Claim(s) \_\_\_\_\_ is/are allowed.  
6)  Claim(s) 1-36 is/are rejected.  
7)  Claim(s) \_\_\_\_\_ is/are objected to.  
8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on \_\_\_\_\_ is/are: a)  accepted or b)  objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All b)  Some \* c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)  Notice of References Cited (PTO-892)  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3)  Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 8/26/04.

4)  Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.

5)  Notice of Informal Patent Application (PTO-152)

6)  Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Specification***

The specification has been checked to the extent necessary to determine the presence of all possible minor errors. However, the applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claims Objection***

Claims 1 and 31 are objected to because it does not clearly recite the preamble and the body. Correction is required.

### ***Claim Rejections***

#### ***Claim Rejections - 35 USC § 112***

Claims 1-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Correction or clarification is required.

In claim 1, the recitation "the voltage" on line 6, "the potential node" on line 7, "the charge" on line 13 lacks clear antecedent basis. It is unclear what the "nominal value" on line 17 is and if the recitation "capacitor array" on line 14 is additional "array" or further recitation of the previously claimed "capacitor array" on line 13. Also, the description of the present invention is incomplete because the comparator and the controller are not connected to anything. Thus, the claimed comparator and the controller may not perform the recited function. The same is true for claim 31.

In claim 3, it is unclear where the “switches” come from and how they are “provided” to vary the charge.

In claim 8, the recitation “the number” on line 3 lacks clear antecedent basis.

In claim 17, it is not understood how the tuning capacitors can be a function of the coded tuning control signal and what the function is.

In claim 12, it is not understood what the “basic capacitance” is and where it comes from.

In claim 14, the recitation “can be” on line 2 is indefinite because it does not positively recite the claimed invention.

In claim 15, it is not understood how the filter stage can have a “completely differential operational amplifier and if this is additional “amplifier” or further recitation of the previously claimed “comparator” in claim 1. The same is true for reciting ‘amplifier in claims 16-17 and 29.

In claim 16, the recitation “the potential node” on line 5 and “the capacitor” on line 8 lacks clear antecedent basis. Also, the recitation “potential node” on line 3 is confusing because it is unclear if this is additional “node” or further recitation of the previously claimed “node” in claim 1.

In claim 18, the recitation “comparator . . . second RC element” on lines 2-6 is read on the preferred embodiment. Insofar as understood, no such connection is seen on the drawings. The same is true for reciting “first input signal” on line 3 of claim 21 and “means of switches” on line 3 of claim 23.

In claim 22, the recitation “the second input of the comparator can alternatively be connected by means of switches” is misdescriptive because it is inconsistent with what is recited

in claim 21. For example, line 5 of claim 21 recites that the second input is receive the reference ground voltage. Therefore, it cannot be connected to other voltage sources.

In claim 25, the recitation “the overall time” and “the charge variation” lacks clear antecedent basis. The same is true for reciting “the two charge variation times” in claim 34.

In claim 32, it is not understood what the “specific first reference ground voltage” is. The same is true for reciting “second reference ground voltage” in claim 34.

In claim 35, the recitation “a capacitor” on lines 2 and 4 is confusing because it is unclear if this is additional “capacitor” or further recitation of the previously claimed “capacitor” in claim 31. It is not understood where the “first RC element” and “a second RC element” and “second reference ground voltage” come from since the filter stage contains only one RC element as recited in claim 31.

The remaining claims are dependent from the above claims and therefore also considered indefinite.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-13 and 26-32 are rejected under 35 USC 103 (a) as being unpatentable over Low et al (US 6,677,814) in view of Gehring et al (US 6,842,710).

Low et al discloses in Figure 1 a tunable filter circuit comprising:

- a comparator (102) for comparing a voltage at a potential node (104) between a resistor (110) and a capacitor array (120) and a reference voltage (V2); and
- a controller (130, 140, 160, 170) for switching a capacitor array (120) to vary the charge on the capacitor array (120) in order to compensate for any discrepancy between the RC constant and a nominal value.

However, Low et al does not disclose that the capacitor array (120) includes a fix capacitor coupled in parallel to the switched capacitors (S1-Sn, C1-Cn) and the amplifier is configured in a fully differential amplifier.

Gehring et al reaches in Figure 2 a selectable capacitor circuit comprising a fixed capacitor (Cbase) coupled in parallel with a capacitor array (275) for providing a lowest limit capacitance (base capacitance) for the selectable capacitor circuit. It would have been obvious to a person having skill in the art at the time the invention was made to employ the fixed capacitor as suggested by Gehring et al in the circuit of Low et al for the purpose of providing a lowest limit capacitance (base capacitance) for the filter circuit.

With regard to claim 3, the controller (170) drives the switches (S1-Sn).

With regard to claim 5, employing the CMOS switches are suggested as CMOS transistors (276) in Figure 2 of Gehring et al.

With regard to claims 6-8, the recitation "digital counter" is read on the counter (140) in

Figure 1 of Low et al. The counter is clocked by external clock signal from an clock signal generator (150) and counts the number of clock cycles from the external clock signal between reception of a start signal and reception of a stop signal which is received from the comparator (160).

With regard to claims 9-10, the recitation “a memory” for storing tuning signal code is read on the memory (130) as shown in Figure 1 of Gehring et al.

With regard to claim 13, the capacitor array are formed by MOS transistors so that they can be integrated on an IC as suggested in the Gehring et al reference.

With regard to claims 26-28, it is well known in the art that the filter includes different types such as biquad filter or anti-aliasing filter. Selecting the filter type of Low et al for accommodating with a particular application is considered to be a matter of a design expedient for an engineer. Lacking of showing any criticality, it would have been obvious to select the filter type of Low et al as claimed for the purpose of accommodating with the requirement of a predetermined system.

Claims 14-21 are rejected under 35 USC 103 (a) as being unpatentable over Low et al (US 6,677,814) in view of Gehring et al (US 6,842,710) and further in view of Khorramabadi et al (US 5,982,228) and Babanezhad (US 6,069,505).

Low et al in view of Gehring et al discloses as filter circuit as stated above but does not disclose that the filter can has fully differential operational amplifier and the filter can be switched between a normal mode and a tuning mode as recited in claim 14. Khorramabadi et al suggests in Figure 1 a tunable filter comprising an input switch (70) for selectively connecting

the filter (40) to an input source in a normal mode or to the test source (60) in a tuning mode so that the filter can be calibrated without removing from system in which the filter of Khorramabadi et al is to be used. Badanezhad teaches in Figure 4 a fully differential filter comprising a fully differential amplifier having feedback capacitors C and resistor (110) for providing two out of phase filtered outputs.

It would have been obvious to a person having skill in the art at the time the invention was made to incorporate the suggestion of using an input switch for selecting between the normal mode and the tuning mode as suggested by Khorramabadi et al into the circuit of Low et al for the purpose of calibrating the filter without removing the filter from the system.

It would have been obvious to a person having skill in the art at the time the invention was made to employ the fully differential amplifier suggested by Babanezhad in the modified filter circuit of Low et al for the purpose of providing two out of phase filtered outputs.

#### ***Allowable Subject Matter***

Claims 22-25 and 33-36 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The claims are allowed because the prior art of record does not show the second input of the comparator is alternatively connected to a first reference voltage source or a second reference voltage source.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DINH T. LE whose telephone number is (571) 272-1745. The examiner can normally be reached on Monday-Friday (8AM-7PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, TIMOTHY CALLAHAN can be reached at (571) 272-1740.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



DINH T. LE  
PRIMARY EXAMINER